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Master
Specification
No. 482

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

George K. Burgess, Director

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UNITED STATES GOVERNMENT MASTER SPECIFICATION FOR LEATHER, BAG

FEDERAL SPECIFICATIONS BOARD SPECIFICATION No. 482

This specification was officially promulgated by the Federal Specifications Board on April 25, 1927, for the use of the departments and independent establishments of the Government in the purchase of bag leather.

[The latest date on which the technical requirements of this specification shall become mandatory for all departments and independent establishments of the Government is July 25, 1927. They may be put into effect, however, at any earlier date, after promulgation.]

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I. GENERAL SPECIFICATIONS

There are no general specifications applicable to this specification.

II. GRADE

Bag leather shall be of one grade only and shall consist of the grain or first cut from a hide, in the form of sides.

III. MATERIAL

Bag leather shall be tanned with vegetable tanning materials.

IV. GENERAL REQUIREMENTS

1. Definition of Side.—A side is a full half hide with the forehead trimmed off at the eye, tail not more than 2 inches long, front shank trimmed off at the knee, and snout cut off.

2. Selections.—"A" selection shall consist of leather free from brands, cuts, open scratches, scores, open grub holes, and deep wrinkles, excepting that 50 per cent of the sides may have one of the following defects: (*a*) Open grub holes confined within a circle 6 inches in diameter, (*b*) three open grub holes regardless of location, (*c*) not more than two flesh or grain cuts which shall not exceed 2½ inches in length.

"B" selection shall consist of leather having not more than five defects, such as flesh cuts, grain cuts, grain scratches, or scores not exceeding 4 inches in length, and may have one of the following defects: (*a*) Not more than eight open grub holes regardless of location, (*b*) one small butt brand not exceeding 6 inches in the longest dimension, (*c*) one hip mark not exceeding 6 inches in the longest dimension, (*d*) either (*b*) or (*c*) and three open grub holes regardless of location.

V. DETAIL REQUIREMENTS

1. Area of Sides.—The area of a side shall not be less than 18 square feet.

2. Thickness.—The thickness of the leather shall be 5/64 inch 6/64 inch, or 7/64 inch, as specified, plus or minus 1/128 inch.

3. Crackiness.—The finished surface shall not crack.

4. Tensile Strength.—The leather shall not begin to tear when subjected to a load of 350 pounds for 5/64 inch leather, 400 pounds for 6/64 inch leather, and 450 pounds for 7/64 inch leather.

5. Stretch.—The percentage stretch shall not exceed 25 per cent.

6. Fiber Appearance.—A vertical section of leather shall show not less than 15 per cent of the thickness to be fine-grain fibers.

7. Color.—The color of the leather shall be natural russet or black and bright or dull, as specified. Black leather shall have a fast color.

8. Finish.—The finish shall be full grain or full grain (snuffed), and either smooth, hand boarded, or machine grained, as specified.

9. Chemical Requirements.—The leather, on analysis, shall be in accordance with the requirements of the following table:

Chemical requirements (percentage on moisture-free basis)

	Minimum	Maximum
Grease (petroleum ether extract)	8	12
Unsaponifiable greases	------	25
Acid (modified Proctor and Searle method)	------	.75
Glucose	------	2
Total ash	------	1

VI. METHODS OF INSPECTION AND TESTS

1. Inspection to Determine Compliance with Specifications.—This inspection shall be at the point of manufacture when practicable, but the right is reserved to inspect at the point of delivery, in which case the material, if rejected, shall be removed by the contractor at his own expense.

2. Sampling.—

Number of sides delivered	Number to be sampled
Up to 50	2
50 to 100	3
100 to 200	4

Samples for test purposes shall be cut from locations A, B, and C, as shown in Figure 1.

Physical-test specimens shall be cut from the samples marked A, as described hereafter. From the remaining portions of the samples marked A, and from samples B and samples C, a composite sample shall be prepared for the chemical tests.

The samples for each lot of 200 or fraction thereof shall be tested separately.

3. Thickness.—The thickness shall be measured with a Woburn gauge, or equivalent, at various locations on the side. The thickness of portions within the area may be measured by doubling the leather on itself and measuring the double thickness and then dividing by two. (The Woburn-gauge ounce is equal to 1/64 inch in the English scale.)

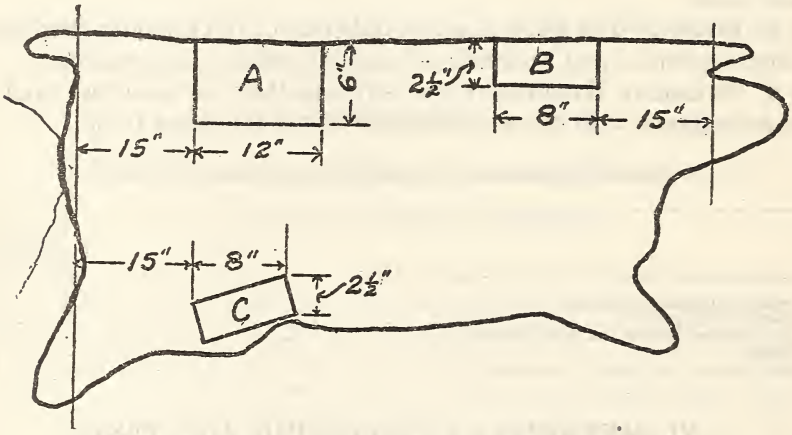

Fig. 1.—*Locations and sizes of samples*

4. Crackiness.—The leather shall not crack open on the grain side when doubled on itself by hand, grain side out.

5. Tensile Strength.—Three test pieces from sample A shall be cut 6 inches long by 3 inches wide. They shall be tested in a machine which has jaws 3 inches apart. The upper jaw shall be 1 inch in width and centrally located on the test piece. The lower jaw may be either 2 or 3 inches in width.

6. Stretch.—The amount of stretch shall be determined by measuring, in inches, the separation of the jaws of the testing machine at the loads specified in Section V, 4. The percentage stretch is calculated by dividing the amount of stretch by the gauge length of 3 inches.

7. Fastness of Color.—The color of black leather shall not come off when it is rubbed with a wet cloth.

8. Moisture.—Dry 10 g of leather for 16 hours at a temperature between 95 and 100° C.

9. Grease (Petroleum Ether Extract).—Extract 5 to 10 g of air-dry leather in a Söxhiet or other suitable apparatus until free from grease, using petroleum ether boiling below 80° C. Evaporate off the ether and dry to approximately constant weight.

10. Unsaponifiable Greases.—Place 1 to 2 g of grease (petroleum ether extract) in a 200 cc flask and add exactly 25 cc of half normal alcoholic potash solution. Place exactly 25 cc of half-normal alcoholic potash solution in another 200 cc flask and run as a blank. Close both flasks with corks fitted with vertical glass tubes approximately 50 cm long and 4 mm bore, to serve as reflux condensers. Allow to simmer on a steam bath for two hours and then add 1 cc of 1 per cent phenolphthalein solution. Titrate with standard half-normal hydrochloric acid solution. Determine the difference between the amounts of acid used in the two tests in cc, multiply by 28.05 and divide by the weight of grease used in grams to secure the saponification number. Divide the saponification number by 188 (the mean value for cod oil), multiply by 100, and subtract from 100 to secure the percentage of unsaponifiable greases.

11. Acid (Modified Proctor and Searle Method).—Weigh a 2 g sample. Add 25 cc of *N*/10 sodium carbonate in the case of an unloaded leather (or a larger amount, 35 or 50 cc in the case of a leather highly loaded with Epsom salts). After careful evaporation to dryness ignite [1] the contents of the dish until as much of the carbon is burned off as possible. Add 25 cc of hot water and digest a few moments. Filter the solution into a 300 cc flask. Wash the filter paper and unburned carbon well with hot water. Return to the dish and completely ignite. To the remaining ash add an amount of *N*/10 sulphuric acid equivalent to the amount of sodium carbonate used, digest for at least 15 minutes either on the water bath or on a hot plate. Filter into the flask containing the first filtrate and titrate the excess of acid with *N*/10 sodium carbonate, using methyl orange as the indicator.

12. Glucose.—Place 200 cc of leather extract of analytical strength in a one-half liter flask, add 25 cc of a saturated solution of normal lead acetate, shake frequently (5 to 10 minutes), and filter. (The funnels and beakers must be kept covered to prevent evaporation.) Add to the filtrate an excess of solid potassium oxalate. Mix frequently for 15 minutes and filter, returning the filtrate until clear. Pipette 150 cc of this filtrate into a 600 cc Erlenmeyer flask, add 5 cc of concentrated HCl, and boil under a reflux condenser for two hours. Cool, neutralize (place a small piece of

[1] Since sodium carbonate is very volatile, this ignition should take place at as low a temperature as possible.

litmus paper in the flask) with anhydrous sodium carbonate, transfer to a 200 cc graduated flask, and make to volume. Filter through a double filter. (Filtrate must be clear.) Determine the dextrose immediately in 500 cc of the solution according to the Munson and Walker method [2] and report in percentage on leather.

13. Total Ash.—Incinerate 5 g of leather in a muffle furnace at 600° C. Cool in desiccator and weigh. If furnace is not available, carbonize sample, add hot water and pulverize, filter through an ashless filter paper, ignite filter and residue, add filtrate, evaporate to dryness, and ignite at low heat. Cool and weigh.

VII. PACKING AND MARKING OF SHIPMENTS

1. Packing.—Shall be in accordance with the practice of the contractor, unless otherwise specified in the request for bids.

2. Marking.—Each side shall be marked with its area in square feet. Each bundle of sides shall be marked with the name of the contractor, name of material, and contract, order, requisition, or schedule number.

VIII. NOTES

1. Request for Bids.—The request for bids should specify the number of square feet desired, the selection, the thickness, the color, and the finish.

2. Use of the Leather.—The major uses of the leather covered by this specification are for the manufacture of letter carriers' satchels and special delivery bags for the Post Office Department and in the manufacture of cases and bags for the War Department.

[2] This method may be found in the following references: J. C. S., 28, pp. 663–686; 1906; Bureau of Chemistry Bulletin 107; Methods of Analysis of the A. O. A. C., 1920 edition; and A. L. C. A. Methods of Analysis for Vegetable Tanned Leather; 1924.

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